6-1-1951

Test 459: McCormick WD-6

The Experiment Station
University of Nebraska College of Agriculture
W. V. Lambert, Director, Lincoln, Nebraska

Department of Agricultural Engineering
Dates of test: June 1 to June 14, 1951.
Manufacturer: INTERNATIONAL HARVESTER COMPANY, CHICAGO, ILLINOIS
Manufacturer's rating: Not rated.

NEBRASKA TRACTOR TEST NO. 459

McCORMICK WD-6

BELT HORSEPOWER TESTS

Hp	Crank shaft speed rpm	Fuel Consumption: Gal per hour	Fuel Consumption: Hp-hr per gal	Fuel Consumption: Lb per hp-hour	Water used gal per hour	Temp Deg F: Cooling med	Temp Deg F: Air	Barometer inches of mercury
TESTS B AND C—100% MAXIMUM LOAD—TWO HOURS								
37.64	1451	2.708	13.90	0.495	0.00	193	73	28.965
TEST D—RATED LOAD—ONE HOUR								
33.52	1451	2.444	13.72	0.501	0.00	192	77	28.975
TEST E—VARYING LOAD—TWO HOURS (20 minute runs; last line average)								
33.55	1452	2.440	13.75	0.500	...	195	78	.....
1.40	1513	0.904	1.55	4.436	...	198	78	.....
17.11	1474	1.545	11.07	0.621	...	194	78	.....
35.89	1380	2.510	14.30	0.481	...	202	79	.....
8.70	1496	1.174	7.41	0.928	...	195	79	.....
25.22	1451	1.955	12.90	0.533	...	198	79	.....
20.31	1461	1.755	11.57	0.594	0.00	197	78	28.975

DRAWBAR HORSEPOWER TESTS

Hp	Draw bar pull lb	Speed miles per hr	Crank shaft speed rpm	Slip of drive wheels %	Fuel Consumption: Gal per hour	Fuel Consumption: Hp-hr per gal	Fuel Consumption: Lb per hp-hr	Water used gal per hour	Temp Deg F: Cooling med	Temp Deg F: Air	Barometer inches of mercury
TESTS F AND G—100% MAXIMUM LOAD											
27.99	5095	2.06	1450	16.42	—Not Recorded—				182	83	28.975
33.06	3771	3.29	1450	7.19	—Not Recorded—				188	80	28.975
33.25	2835	4.40	1454	5.03	—Not Recorded—				188	79	28.975
32.96	2298	5.38	1449	4.01	—Not Recorded—				186	79	28.975
27.48	624	16.52	1449	0.40	—Not Recorded—				182	80	28.975
TEST H—RATED LOAD—TEN HOURS—3RD GEAR											
26.46	2237	4.44	1450	3.96	2.163	12.23	0.562	0.00	193	78	28.825
TEST J—OPERATING MAXIMUM LOAD—3RD GEAR											
32.40	2907	4.18	1450	12.25	—Not Recorded—				190	70	28.900
TEST K—OPERATING MAXIMUM LOAD—3RD GEAR											
29.69	2887	3.86	1455	15.94	—Not Recorded—				191	79	28.900

FUEL, OIL and TIME Diesel Fuel cetane No 47 (rating taken from oil company's typical inspection data); weight per gallon 6.873 lb **Oil** SAE 20; to motor 2.247 gal; drained from motor 2.023 gal **Total time motor was operated** 42 hours.

CHASSIS Type standard **Serial No** WDBK39582 **Tread width** rear 55", 57" or 61" front 46¾", 47¾", 50¾" **Wheel Base** 76" **Hydraulic control system** not available **Advertised speeds mph** first 2⅜ second 3⅜ third 4⅜ fourth 5¼ fifth 15¾ reverse 2⅞ **Belt pulley** diam 11" face 7½" rpm 899 **Belt speed** 2588 fpm **Clutch** dry single plate operated by foot pedal **Seat** pressed steel with canvas covered felt pad **Brakes** external contracting bands operated by right foot on pedals either independently or interlocked **Equalized** by springs when pedals are locked together **Power take-off** standard type.

ENGINE Make International Harvester **Type** 4 cylinder vertical diesel **Serial No** FDBKM18295 **Crankshaft mounted** lengthwise **Head** I **Lubrication** pressure **Bore and Stroke** 3⅞" x 5¼" **Rated rpm** 1450 **Compression ratio** 16.8 to 1 **Displacement** 247.7 cu in **Port Diameter Valves** inlet 1.500" exhaust 1.316" **Governor** variable speed centrifugal **Carburetor Size** ¾" (for starting only) **Ignition System** magneto (for starting only) **Starting System** 12 volt **Air Cleaner** oil washed wire mesh **Muffler** was used **Fuel Filter** one cotton auxiliary filter and one final radial fin paper filter **Oil Filter** partial flow radial fin paper replaceable element **Cooling medium temperature control** thermostat and shutters.

REPAIRS AND ADJUSTMENTS No repairs or adjustments.

REMARKS All test results were determined from observed data and without allowances, additions or deductions. Tests B and F were made with fuel pumps set to develop approximately 39.3 corrected belt horsepower and data from these tests were used in determining the horsepower to be developed in tests D and H, respectively. Tests C, D, E, G, H J, and K were made with the same setting.

TIRES, WHEELS and WEIGHT

	Tests F, G, & H	Test J	Test K
Rear wheels Type	Cast spoke	Cast spoke	Cast spoke
Liquid ballast	808 lb each	None	None
Added cast iron	725 lb each	None	None
Rear tires No. and size	Two 14-30	Two 14-30	Two 13-30
Ply	6	6	6
Air Pressure	16 lb	12 lb	12 lb
Front wheels Type	Cast spoke	Cast spoke	Cast spoke
Liquid ballast	None	None	None
Added cast iron	None	None	None
Front tires No. and size	Two 6.00-16	Two 6.00-16	Two 6.00-16
Ply	6	6	6
Air pressure	28 lb	28 lb	28 lb
Height of drawbar	23 inches	24½ inches	23 inches
Static weight Rear end	6380 lb	3314 lb	3276 lb
Front end	2295 lb	2300 lb	2300 lb
Total weight as tested with operator	8850 lb	5789 lb	5751 lb

HORSEPOWER SUMMARY

	Draw-bar	Belt
1. Sea level (calculated)maximum horsepower (based on 60° F and 29.92" Hg)	34.96	39.36
2. Observed maximum horsepower (tests F & B)	33.25	37.64
3. Seventy-five per cent of calculated maximum drawbar horsepower and eighty-five per cent of calculated maximum belt horsepower (formerly ASAE and SAE ratings)	26.22	33.46

We, the undersigned, certify that this is a true and correct report of official tractor test No. 459.

L. F. LARSEN
Engineer in Charge

C. W. SMITH
F. D. YUNG
L. W. HURLBUT
Board of Tractor Test Engineers

EXPLANATION OF TEST REPORT

TEST A: The manufacturer's representative operates the tractor for a minimum of 12 hours, using light to heavy drawbar loads in each gear. This serves as a preliminary period for limber up, general observation and adjustments. No data are recorded during this preliminary run.

BELT HORSEPOWER TESTS

TEST B: The throttle valve is held wide open and the belt load on the dynamometer is adjusted so that the engine is as near as practical to the rated speed recommended by the manufacturer. Carburetor, ignition timing and manifold adjustments are all set for maximum engine power.

TEST C: The manufacturer has an opportunity to select a more practical carburetor setting which may slightly lower the power output but give better fuel economy. As in test B, the throttle valve is held wide open and the load is adjusted to give the rated engine speed. Tests B and C may be the same, as in the case of a diesel engine where the manufacturer wants to use the same setting as in test B. The same setting is used for tests D, E, G, H, J and K.

TEST D: The throttle control lever is set so the governor will maintain rated engine speed when rated load is applied. Rated load is 85% of 100% maximum, as obtained in test B, corrected to standard conditions.

TEST E: This test serves to show how well the governor controls the engine speed when the following loads are applied: rated load, no load, ½ load, maximum load at wide-open throttle, ¼ load and ¾ load. This test also shows some significant fuel consumption results for these loads. The average fuel consumption given for this test is quite significant. The average farm tractor is subjected to a varying load condition throughout the year.

DRAWBAR HORSEPOWER TESTS

In all drawbar tests the pull exerted by the tractor is transmitted by a hydraulic pressure cylinder to a recording instrument in the test car. All tests are made on the same dirt test course which is maintained by grading, sprinkling and rolling so that it remains very nearly the same throughout the season. The same tires, wheels and weights are used for all tests except J and K.

TEST F: The tractor is operated in the gear designated by the manufacturer as rated gear (the gear recommended as most suitable for plowing). The carburetor is set as in test B. The throttle valve is held wide open and the drawbar load adjusted to maintain rated engine speed. Results of this test are used to determine the rated load for test H.

TEST G: The tractor is tested for maximum drawbar horsepower in each gear, using the more efficient carburetor setting as determined in test C. The throttle valve is held wide open and the load is applied so that the engine runs at rated engine speed. When operating in the lower gears the tractor often is unable to develop maximum horsepower because of excessive wheel slippage. Then the load is reduced until slippage approaches 16%.

TEST H: This test lasts 10 hours and is the only drawbar test where fuel consumption is measured. The load applied is 75% of 100% maximum drawbar horsepower (test F) corrected to standard conditions. The throttle lever is set so that the governor gives rated engine speed.

TEST J: The tractor is operated in rated gear with all added weight removed. This test shows the effect of the removal of added weight on the performance of the tractor.

TEST K: Similar to test J except that the smallest tires and lightest wheels recommended by the manufacturer are used.